EVVOSEMI®
THINK CHANGE DO

ESD TVS MOS LDO Diode Sensor DC-DC

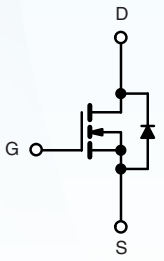
Product Specification

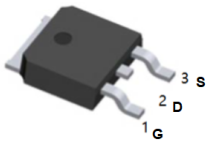
Domestic Part Number	FQD20N06
Overseas Part Number	FQD20N06
Equivalent Part Number	FQD20N06

60V N-Channel MOSFET

General Description

This advanced MOSFET technology has been especially tailored to reduce on-state resistance, and to provide superior switching performance and high avalanche energy strength. These devices are suitable for switched mode power supplies, audio amplifier, DC motor control, and variable switching power applications.





TO-252(DPAK) top view

V_{DS}	60V
I_D (at V_{GS}=10V)	30A
$R_{DS(ON)}$ (at V_{GS}=10V)	< 25mΩ
$R_{DS(ON)}$ (at V_{GS} = 4.5V)	< 30mΩ

ABSOLUTE MAXIMUM RATINGS T_C = 25 °C, unless otherwise noted				
Parameter		Symbol	Limit	Unit
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current (T_J = 175 °C)[a]	T_C = 25 °C	I_D	35	A
	T_C = 100 °C		28	
Pulsed Drain Current		I_{DM}	100	
Continuous Source Current (Diode Conduction)		I_S	23	
Avalanche Current		I_{AS}	20	
Single Avalanche Energy (Duty Cycle ≤ 1 %)	L = 0.1 mH	E_{AS}	20	mJ
Maximum Power Dissipation	T_C = 25 °C	P_D	100	W
	T_A = 25 °C		3	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 175	°C

THERMAL RESISTANCE RATINGS					
Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient	t ≤ 10 sec	R_{thJA}	18	22	°C/W
	Steady State		40	50	
Maximum Junction-to-Case		R_{thJC}	3.2	4	

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SPECIFICATIONS T_J = 25 °C, unless otherwise noted						
Parameter	**Symbol**	**Test Conditions**	**Min**	**Typ**	**Max**	**Unit**
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = 250 µA	60			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA	1.0	2.0	3.0	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 60 V, V_{GS} = 0 V			1	µA
		V_{DS} = 60 V, V_{GS} = 0 V, T_J = 125 °C			50	
		V_{DS} = 60 V, V_{GS} = 0 V, T_J = 175 °C			250	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} = 5 V, V_{GS} = 10 V	50			A
Drain-Source On-State Resistance[a]	$r_{DS(on)}$	V_{GS} = 10 V, I_D = 15 A		25	31	mΩ
		V_{GS} = 10 V, I_D = 15 A, T_J = 125 °C			55	
		V_{GS} = 10 V, I_D = 15 A, T_J = 175 °C			69	
		V_{GS} = 4.5 V, I_D = 10 A		30	45	
Forward Transconductance[a]	g_{fs}	V_{DS} = 15 V, I_D = 15 A		20		S
Dynamic						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		670		pF
Output Capacitance	C_{oss}			140		
Reverse Transfer Capacitance	C_{rss}			60		
Total Gate Charge[b]	Q_g	V_{DS} = 30 V, V_{GS} = 10 V, I_D = 23 A		11	17	nC
Gate-Source Charge[b]	Q_{gs}			3		
Gate-Drain Charge[b]	Q_{gd}			3		
Turn-On Delay Time[b]	$t_{d(on)}$	V_{DD} = 30 V, R_L = 1.3 Ω $I_D \cong$ 23 A, V_{GEN} = 10 V, R_g = 2.5 Ω		8	15	ns
Rise Time[b]	t_r			15	25	
Turn-Off Delay Time[b]	$t_{d(off)}$			30	45	
Fall Time[b]	t_f			25	40	
Source-Drain Diode Ratings and Characteristics (T_C = 25 °C)						
Pulsed Current	I_{SM}				50	A
Diode Forward Voltage	V_{SD}	I_F = 15 A, V_{GS} = 0 V		1.0	1.5	V
Reverse Recovery Time	t_{rr}	I_F = 15 A, di/dt = 100 A/µs		30	60	ns

a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.
b. Independent of operating temperature.

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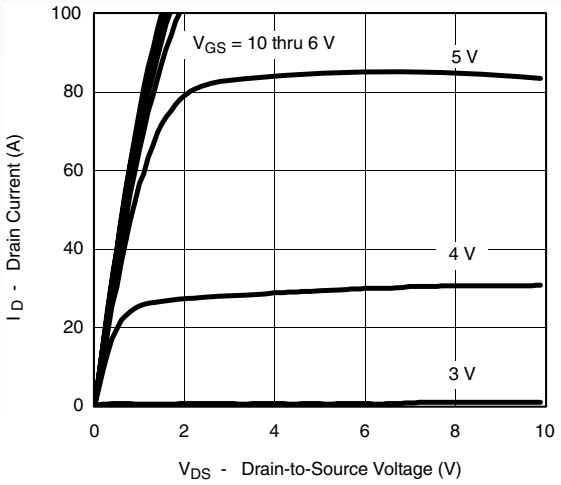
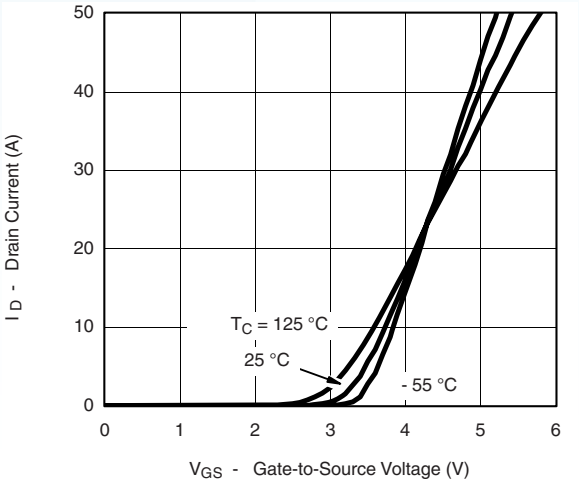
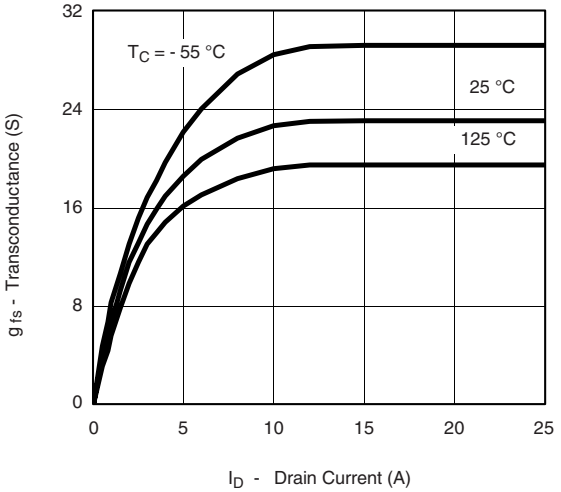
TYPICAL CHARACTERISTICS 25 °C unless noted



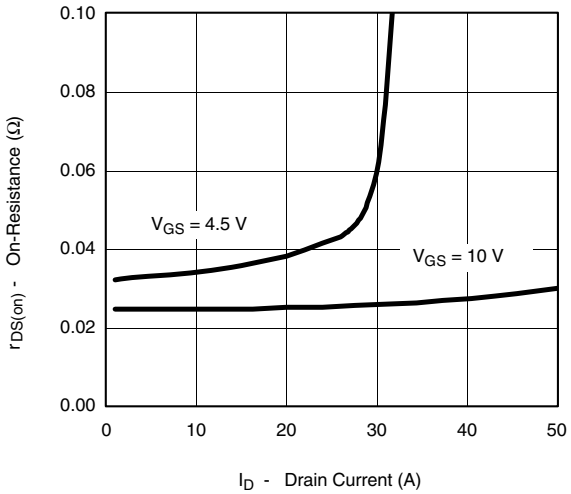
Output Characteristics



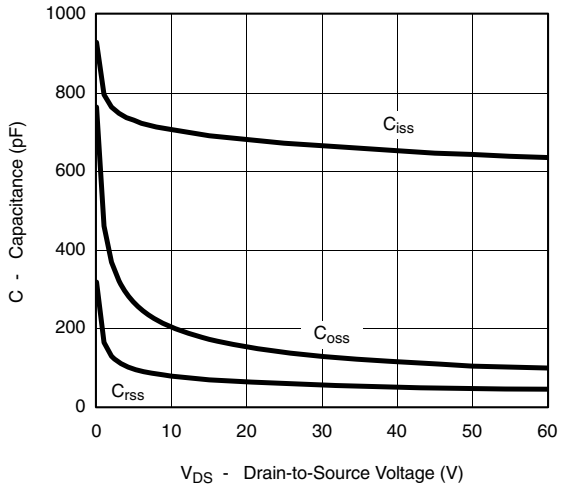
Transfer Characteristics



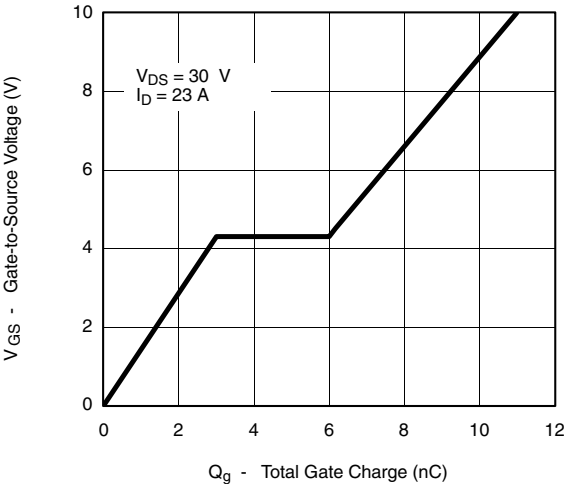
Transconductance



On-Resistance vs. Drain Current



Capacitance



Gate Charge

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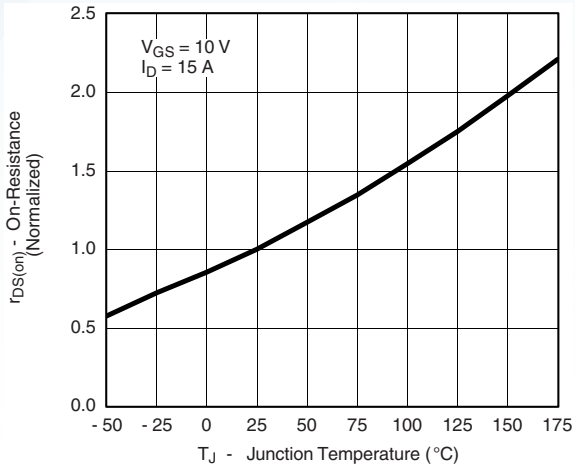
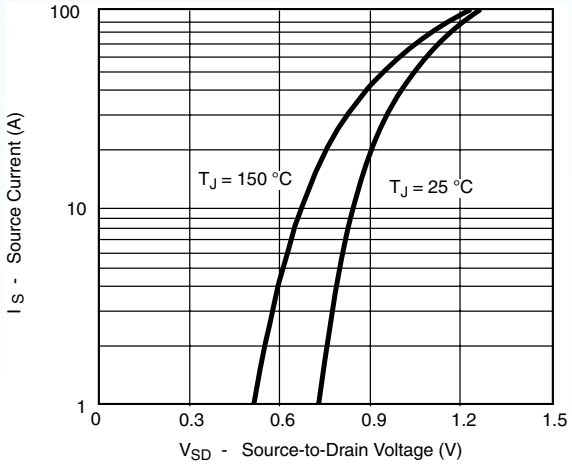
TYPICAL CHARACTERISTICS 25 °C unless noted



On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage

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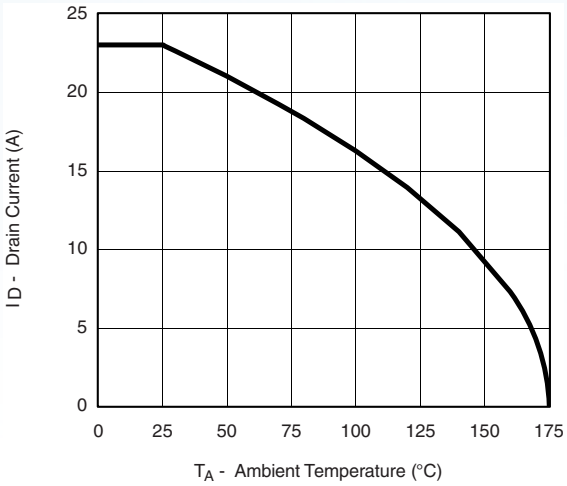
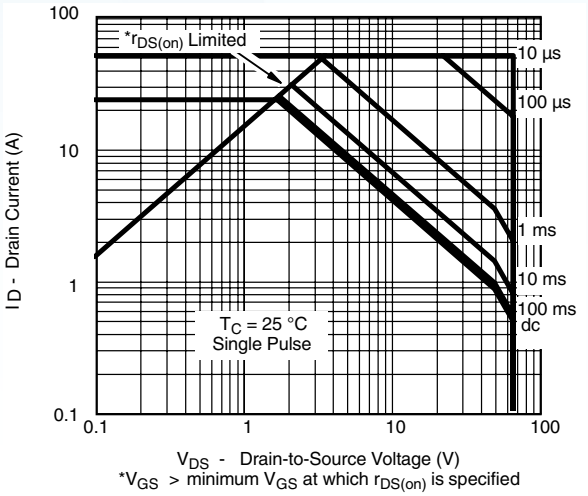
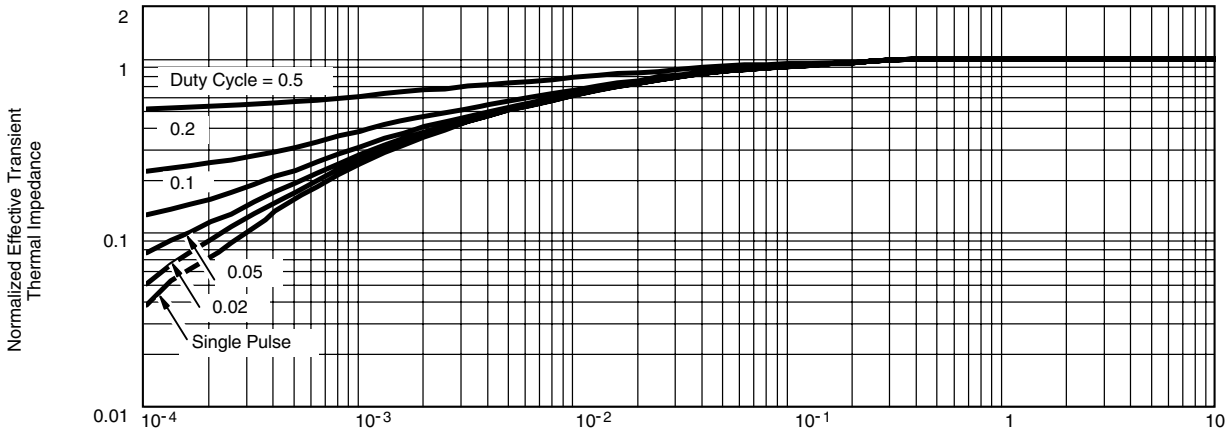
THERMAL RATINGS



Maximum Drain Current vs. Ambient Temperature



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case

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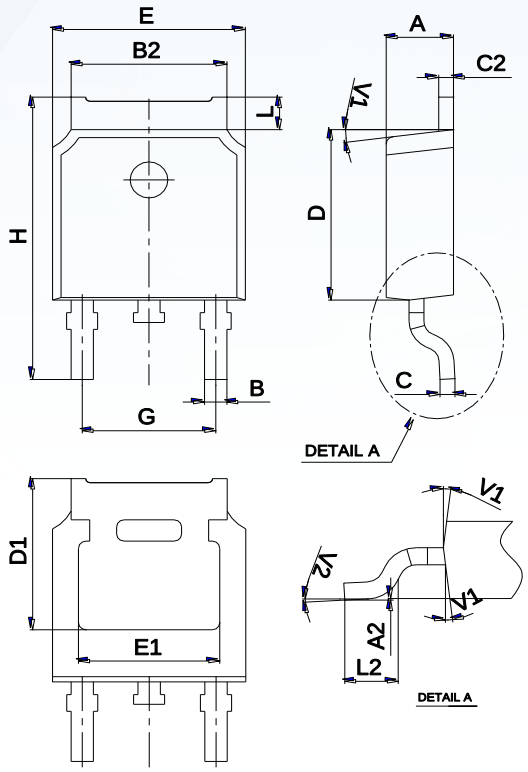
Package Mechanical Data TO-252



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

Ordering information

Order code	Package	Baseqty	Delivery mode
FQD20N06	TO-252	2500	Tape and reel

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